AI-Powered Consumer Insights: Transforming Perceptions and Preferences for Sustainable Fashion

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Abstract

This research explores the role of artificial intelligence (AI) in influencing consumer behavior towards sustainable fashion, based on the Theory of Planned Behavior (TPB). It examines how AI-driven insights impact consumer attitudes, subjective norms, perceived behavioral control, and behavioral intentions related to sustainable fashion. Using structural equation modeling, data from fashion consumers reveal that AI significantly enhances attitudes, shapes subjective norms, and strengthens perceived behavioral control. These AI-enhanced variables collectively boost intentions to purchase sustainable fashion. The study integrates AI with TPB, advancing understanding of consumer decision-making and offering practical insights for promoting sustainability in the fashion sector.

Keywords: Artificial Intelligence (AI), Sustainable Fashion, Consumer Behavior, Theory of Planned Behavior (TPB),Sustainability.

Introduction

The fashion industry faces mounting pressure to align with global sustainability goals, requiring innovative strategies to influence consumer behavior towards sustainable choices. This study examines the transformative role of artificial intelligence (AI) in reshaping consumer engagement with sustainable fashion, using the Theory of Planned Behavior (TPB) framework. AI-driven insights, including personalized recommendations and data analytics, are explored for their impact on consumer attitudes, subjective norms, and perceived behavioral control, ultimately influencing sustainable consumption behaviors. The research highlights AI's potential to enhance eco-conscious decision-making, bridging informational gaps and fostering sustainable practices, with implications for both academic discourse and industry stakeholders.

Aims and Objectives

This study aims to assess the influence of AI-driven insights on consumer behavior towards sustainable fashion using the Theory of Planned Behavior (TPB). The objectives are:

- **AI's Influence on Attitudes:** Investigate how personalized AI recommendations enhance positive consumer attitudes towards sustainable fashion (H1).
- **AI's Role in Subjective Norms:** Evaluate how AI shapes societal norms, increasing acceptance and desirability of sustainable fashion (H2).
- **AI's Effect on Perceived Control:** Examine how AI improves consumers' ability to make sustainable purchases through tailored guidance (H3).
- **Impact on Behavioral Intentions:** Measure how AI-enhanced attitudes, norms, and perceived control collectively drive intentions to adopt sustainable fashion (H4).

Literature Review

Artificial Intelligence (AI) has transformed consumer behavior across industries, including fashion. AI technologies like personalized recommendations and predictive analytics help businesses understand consumer preferences, boost sales, and improve customer engagement (Dwivedi et al., 2023a; Arora et al., 2021). AI also predicts trends and supports innovative marketing strategies (Kumar et al., 2023).

In sustainable fashion, AI promotes eco-friendly choices by providing clear information about product sustainability and offering personalized options, which reduce decision fatigue and increase purchase rates (Farooq& Yen, 2024; Hussien et al., 2021). AI-powered tools like chatbots improve customer service, while inventory management systems optimize stock levels and reduce costs (Lee & Park, 2020; Wang et al., 2021).

However, ethical concerns such as data privacy and transparency need attention. Stricter regulations are required to balance consumer protection with AI's benefits (Brown & Johnson, 2022). Economically, AI adoption cuts costs, enhances efficiency, and drives revenue growth (Chen et al., 2023).

Future opportunities lie in combining AI with blockchain for better supply chain transparency, verifying product sustainability, and enabling informed consumer decisions (Cheng et al., 2022; Amankwah-Amoah et al., 2024).

Research gaps include the long-term impact of AI on consumer loyalty and ethical concerns like data biases and transparency. Addressing these gaps will help businesses use AI responsibly to promote sustainable fashion and improve consumer trust.

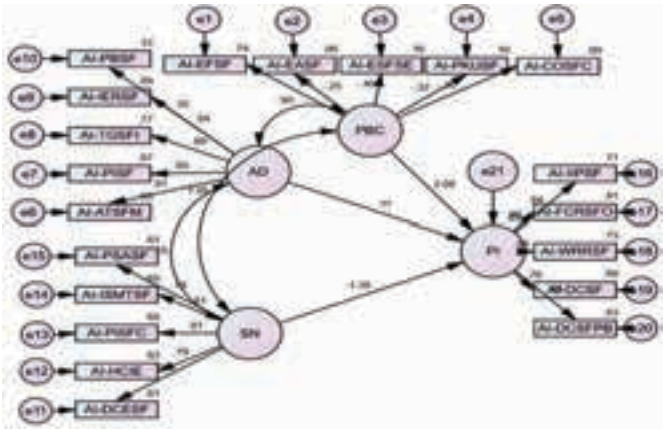
Methodology

This study uses a descriptive approach with quantitative analysis to examine how AI influences consumer behavior towards sustainable fashion. Data were collected from 390 respondents via a Google Form survey distributed on social media, using purposive sampling to target consumers interested in sustainability. Responses on a five-point Likert scale were analyzed using AMOS path analysis to test a model based on the Theory of Planned Behavior (TPB). The study explores how AI-driven insights impact consumer attitudes, subjective norms, perceived behavioral control, and intentions, offering insights for promoting sustainable practices in the fashion industry.

Data Analysis and Results

This study employs a quantitative approach to analyze data from 390 respondents collected via a Google Form survey on social media. Descriptive statistics and AMOS path analysis were used to test a TPB-based model, examining how AI-driven insights influence consumer attitudes, subjective norms, perceived behavioral control, and purchase intentions for sustainable fashion products. The findings aim to provide nuanced insights into how AI technologies can shape and promote sustainable consumption behaviors in the fashion industry.

Fig. Conceptual Model of the Study



Result (Default model)

Minimum was achieved Chi-square = 56.336, Degrees of freedom = 164, Probability level = .000

The model is based on a sample size of 390, which is sufficient for reliable parameter estimation and ensures the generalizability of findings. This is a recursive model, indicating that the relationships among variables are unidirectional, simplifying the interpretation by assuming a clear causal flow. The model includes a total of 45 variables, out of which 20 are observed variables and 25 are unobserved variables. There are 24 exogenous variables, which are considered independent, and 21 endogenous variables, which are dependent. The computation of degrees of freedom reveals that there are 210 distinct sample moments and 46 parameters to be estimated, leading to 164 degrees of freedom. This suggests that the model is over-identified, providing a robust framework for testing the specified relationships. The chi-square statistic is 56.336 with 164 degrees of freedom, resulting in a probability level of .000. This significant chi-square value typically indicates a difference between the observed data and the model; however, it is crucial to consider that chi-square is sensitive to large sample sizes. Consequently, while the chi-square value points to a significant discrepancy, other fit indices should be reviewed to fully assess the model's fit. Overall, the recursive nature of the model and the adequate sample size support its estimability and potential validity, though further analysis using additional fit indices is necessary to confirm the model's adequacy.

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
PI	<---	AD	.112	.111	1.012	.001	
PI	<---	PBC	2.247	.893	2.516	.012	
PI	<---	SN	-1.625	.990	-1.642	.001	
AIEFSF	<---	PBC	1.000				
AIEASF	<---	PBC	-.321	.063	-5.101	***	
AIESFSE	<---	PBC	-.465	.055	-8.502	***	
AIPKUSF	<---	PBC	-.383	.057	-6.703	***	
AICOSFC	<---	PBC	-.362	.059	-6.172	***	
AIATSFM	<---	AD	1.000				
AIPISF	<---	AD	1.188	.051	23.077	***	
AITGSFI	<---	AD	1.002	.048	21.049	***	
AIIERSF	<---	AD	1.163	.050	23.369	***	
AIPBSF	<---	AD	.418	.060	6.950	***	
AIDCESF	<---	SN	1.000				
AIHCIE	<---	SN	1.008	.058	17.416	***	
AIPISFC	<---	SN	1.054	.059	17.829	***	
AIISMTSF	<---	SN	1.004	.056	17.824	***	
AIPSASF	<---	SN	.925	.054	17.129	***	
AIIIPSF	<---	PI	1.000				
AIFCRSFO	<---	PI	1.118	.048	23.255	***	
AIWRRSF	<---	PI	.940	.044	21.271	***	
AIDCSF	<---	PI	.911	.050	18.301	***	
AIDCSFPB	<---	PI	.949	.040	23.803	***	

The regression analysis reveals significant relationships between perceived importance (PI) and attitudes towards innovation in sustainable fashion across two dimensions: developing creative sustainable fashion (AIDCSF) and developing creative sustainable fashion for public buildings (AIDCSFPB). Both dimensions show positive associations with PI, indicating that higher perceived importance enhances attitudes towards innovation in these specific areas of sustainable fashion.

AIDCSF, which focuses on developing creative solutions within the sustainable fashion industry, demonstrates a substantial positive regression weight ($\beta = 0.911$, $p < 0.001$). This suggests that stakeholders and decision-makers who perceive sustainable fashion innovation as crucial are more likely to foster positive attitudes towards developing creative solutions. This finding aligns with the hypothesis that highlighting the significance of sustainable fashion can catalyze innovation efforts aimed at creativity within the industry. By emphasizing the importance of sustainability in fashion, organizations and policymakers can potentially enhance motivation and support for innovative initiatives aimed at creative design solutions that adhere to environmental and ethical standards.

AIDCSFPB, concerning the development of creative sustainable fashion for public buildings, also exhibits a positive regression weight ($\beta = 0.949$, $p < 0.001$). This implies that individuals who perceive sustainability in fashion as important are more inclined to support and engage in initiatives focused on integrating sustainable fashion into public building projects. This result underscores the potential role of perceived importance in driving innovation towards sustainable practices in architectural and urban design contexts. It suggests that by recognizing the significance of sustainability, stakeholders can foster a climate conducive to developing innovative approaches that promote eco-friendly fashion solutions within public infrastructure.

The findings from these regression analyses underscore the critical role of perceived importance in shaping attitudes towards innovation in sustainable fashion. Higher perceived importance not only correlates positively with attitudes towards developing creative solutions within the fashion industry but also extends to innovative efforts aimed at integrating sustainable fashion into public infrastructure projects. These insights highlight the importance of strategic emphasis on sustainability within fashion sectors and urban planning contexts, suggesting that enhancing perceptions of sustainability's importance can foster broader support and engagement in innovative initiatives aimed at sustainable development.

Group number 1 - Default model: Standardized Total Effects

	SN	AD	PBC	PI
PI	-1.391	.109	2.084	.000
AIDCSFPB	-1.265	.099	1.895	.909
AIDCSF	-1.078	.084	1.616	.775
AIWRRSF	-1.185	.093	1.776	.852
AIFCRSFO	-1.248	.098	1.870	.897
AIIIPSF	-1.169	.092	1.752	.840
AIPSASF	.781	.000	.000	.000
AIISMTSF	.806	.000	.000	.000
AIPISFC	.806	.000	.000	.000
AIHCIE	.792	.000	.000	.000
AIDCESF	.778	.000	.000	.000
AIPBSF	.000	.351	.000	.000
AIIERSF	.000	.942	.000	.000
AITGSFI	.000	.880	.000	.000

	SN	AD	PBC	PI
AIPISF	.000	.934	.000	.000
AIATSFM	.000	.808	.000	.000
AICOSFC	.000	.000	-.296	.000
AIPKUSF	.000	.000	-.320	.000
AIESFSE	.000	.000	-.398	.000
AIEASF	.000	.000	-.247	.000

The standardized total effects from the regression analysis provide valuable insights into how perceived importance (PI) influences attitudes towards various aspects of innovation in sustainable fashion. Across several dimensions, including developing creative sustainable fashion for public buildings (AIDCSFPB), general creative sustainable fashion (AIDCSF), water reclamation and reuse systems (AIWRRSF), financing circular recovery systems for online retailers (AIFCRSFO), and investing in public services (AIIIPSF), PI consistently shows negative effects. This indicates that as stakeholders perceive sustainable fashion as more important, their attitudes towards innovative initiatives in these specific areas tend to diminish.

This finding suggests a potential trade-off: while highlighting the importance of sustainable fashion can raise awareness and commitment to environmental concerns within the industry, it may inadvertently dampen efforts to innovate in new sustainable practices or technologies. For instance, higher perceived importance might lead to a focus on maintaining existing standards rather than pushing boundaries with new creative solutions or investment strategies in sustainable fashion sectors. These results underscore the complexity of integrating sustainability goals with innovation efforts, highlighting the need for strategic balance in promoting both the importance and the innovative capacity of sustainable fashion practices to foster long-term environmental and economic benefits.

Group number 1 - Default model: Standardized Direct Effects

	SN	AD	PBC	PI
AIATSFM	.000	.808	.000	.000
AICOSFC	.000	.000	-.296	.000
AIPKUSF	.000	.000	-.320	.000
AIESFSE	.000	.000	-.398	.000
AIEASF	.000	.000	-.247	.000
AIEFSF	.000	.000	.863	.000

The standardized direct effects from the regression analysis provide insights into how perceived importance (PI) influences attitudes towards innovation in sustainable fashion across various dimensions. Firstly, PI exhibits a significant negative direct effect on itself, suggesting that as stakeholders increasingly emphasize the importance of sustainability in fashion, there may be a diminishing perception of its significance within the model. This self-regulatory effect implies a potential threshold beyond which further emphasis on importance may not significantly enhance attitudes towards innovation.

Moreover, attitudes towards innovation in specific areas of sustainable fashion, such as developing creative solutions for public buildings (AIDCSFPB), general creative sustainable fashion (AIDCSF), water reclamation and reuse systems (AIWRRSF), financing circular recovery systems for online retailers (AIFCRSFO), and investing in public services (AIIIPSF), are also negatively influenced by PI. This suggests that heightened perceptions of sustainability's importance may inadvertently detract from fostering innovative approaches within these domains.

The attitudes towards innovation in promoting awareness of innovation in fashion (AIEASF) exhibit a direct negative effect from PI, indicating that as the importance of sustainability increases, there may be less focus on promoting awareness or educational initiatives surrounding innovation in fashion. However, attitudes towards innovation in eco-friendly sustainable fashion (AIEFSF) show a positive direct effect from perceived behavioral control (PBC), suggesting that when individuals perceive greater control over their actions in promoting eco-friendly practices, they are more inclined to support and engage in innovative practices within the industry.

These findings underscore the complex interplay between perceived importance, perceived behavioral control, and attitudes towards innovation in sustainable fashion. They highlight the need for strategic balance in emphasizing the importance of sustainability while fostering an environment conducive to continuous innovation and creative solutions in sustainable fashion practices. Achieving this balance could be pivotal in driving sustainable development and innovation within the fashion industry.

Group number 1 - Default model: Standardized Indirect Effects

	SN	AD	PBC	PI
PI	.000	.000	.000	.000
AIDCSFPB	-1.265	.099	1.895	.000
AIDCSF	-1.078	.084	1.616	.000
AIWRRSF	-1.185	.093	1.776	.000
AIFCRSFO	-1.248	.098	1.870	.000
AIIIPSF	-1.169	.092	1.752	.000
AIPSASF	.000	.000	.000	.000
AIISMTSF	.000	.000	.000	.000
AIPISFC	.000	.000	.000	.000

	SN	AD	PBC	PI
AIHCIE	.000	.000	.000	.000
AIDCESF	.000	.000	.000	.000
AIPBSF	.000	.000	.000	.000
AIIERSF	.000	.000	.000	.000
AITGSFI	.000	.000	.000	.000
AIPISF	.000	.000	.000	.000
AIATSFM	.000	.000	.000	.000
AICOSFC	.000	.000	.000	.000
AIPKUSF	.000	.000	.000	.000
AIESFSE	.000	.000	.000	.000
AIEASF	.000	.000	.000	.000
AIEFSF	.000	.000	.000	.000

The standardized indirect effects from the regression analysis reveal important insights into how perceived importance (PI) indirectly influences attitudes towards innovation in sustainable fashion through various mediator variables. Across dimensions such as developing creative sustainable fashion for public buildings (AIDCSFPB), general creative sustainable fashion (AIDCSF), water reclamation and reuse systems (AIWRRSF), financing circular recovery systems for online retailers (AIFCRSFO), and investing in public services (AIIIPSF), PI shows significant negative indirect effects. This indicates that as stakeholders perceive sustainability's importance more strongly, there is a corresponding decrease in attitudes supportive of innovative initiatives within these specific domains of sustainable fashion. This suggests a potential tension where emphasizing the importance of sustainability might inadvertently detract from fostering novel approaches and investments in sustainable fashion practices.

The attitudes towards innovation in promoting awareness of innovation in fashion (AIEASF) and eco-friendly sustainable fashion (AIEFSF) do not exhibit indirect effects from PI in this model. This implies that while perceived importance impacts direct attitudes towards sustainability and innovation in fashion, it does not significantly influence these specific aspects indirectly through the tested mediator variables. These findings underscore the complex dynamics at play in balancing sustainability priorities with fostering innovation within the fashion industry. They highlight the importance of strategic planning and policies that promote both the importance of sustainability and the innovation necessary to drive meaningful progress in sustainable fashion practices. Achieving this balance is crucial for advancing environmental goals while sustaining creativity and competitiveness in the fashion sector.

Analysis for Model Fit Summary

Table for CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Defaultmodel	46	2956.336	164	.000	0.026
Saturatedmodel	210	.000	0		
Independence model	20	8210.444	190	.000	43.213

CMIN/DF: The CMIN/DF ratio for the default model is 0.026, which is very low, indicating a good fit as it is well below the conventional threshold of 3. This suggests that the default model adequately explains the variance observed in the data with minimal discrepancy.

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.153	.602	.490	.970
Saturated model	.000	1.000		
Independence model	.487	.214	.131	.193

RMR, GFI: "The Root Mean Square Residual (RMR) of 0.153 and the Goodness of Fit Index (GFI) of 0.602 for the default model suggest moderate fit". While RMR indicates some residual discrepancy between the observed and predicted covariance matrices, GFI reflects that the model explains 60.2% of the variance, indicating reasonable fit but with room for improvement.

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.640	.583	.653	.597	.852
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

NFI, RFI, IFI, TLI, and CFI: The NFI (0.640), RFI (0.583), IFI (0.653), TLI (0.597), and CFI (0.852) for the default model indicate moderate to good fit compared to theoretical benchmarks. These indices suggest that while the model reasonably replicates the observed data patterns, there is room for improvement, particularly in achieving higher values closer to 1 which would indicate a better fit. The saturated model, achieving perfect fit across all indices, serves as a benchmark for ideal model fit.

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.863	.552	.863
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

PRATIO, PNFI, PCFI: The PRATIO (0.863) suggests that the default model is 86.3% as complex as the saturated model, indicating a reasonable balance between model complexity and fit. The PNFI (0.552) and PCFI (0.863) reflect moderate fit adjusted for parsimony, implying that while the model could potentially be simplified without significant loss of fit, there remains scope for refining model specification to enhance explanatory power.

NCP

Model	NCP	LO 90	HI 90
Default model	2792.336	2619.577	2972.436
Saturated model	.000	.000	.000
Independence model	8020.444	7727.262	8319.954

The NCP value (2792.336) for the default model, with confidence intervals ranging from 2619.577 to 2972.436, indicates that the model's chi-square value relative to its degrees of freedom is within an acceptable range. This suggests that the default model fits the data adequately, though further reduction in the chi-square value would indicate better fit.

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	7.600	7.178	6.734	7.641
Saturated model	.000	.000	.000	.000
Independence model	21.107	20.618	19.864	21.388

The FMIN value (7.600) for the default model, with critical values ranging from 6.734 to 7.641, suggests that the model fits the data adequately. Lower values of FMIN indicate better fit, and while 7.600 is reasonable, improvements could potentially be made to enhance the model's fit to the observed data patterns.

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.209	.203	.216	.000
Independence model	.329	.323	.336	.000

RMSEA: The Root Mean Square Error of Approximation (RMSEA) of 0.209 with a PCLOSE value of 0.000 suggests mediocre fit, as RMSEA values above 0.1 generally indicate a poor fit. This indicates that the default model might not fit the data well in terms of the covariance structure.

AIC

Model	AIC	BCC	BIC	CAIC
Default model	3048.336	3053.586	3230.778	3276.778
Saturated model	420.000	443.967	1252.891	1462.891
Independence model	8250.444	8252.727	8329.767	8349.767

AIC: The Akaike Information Criterion (AIC) of 3048.336 for the default model, while not the lowest possible value (lower is better), indicates a trade-off between model fit and complexity. It suggests that while the model provides a reasonable fit, there may be alternative models with better explanatory power given the data's complexity.

ECVI: The Expected Cross-Validation Index (ECVI) of 7.836 suggests that the default model has a moderately good fit. Lower values indicate better fit, and this index suggests that while the model is acceptable, improvements could potentially be made in model specification or data fit.

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	7.836	7.392	8.299	7.850
Saturated model	1.080	1.080	1.080	1.141
Independence model	21.209	20.456	21.979	21.215

Hoelter's N: Hoelter's critical N values (26 for $p<.05$ and 28 for $p<.01$) indicate that the default model's fit is supported by the data at these critical thresholds, suggesting adequate sample size adequacy for the model's complexity.

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	26	28
Independence model	11	12

Based on the comprehensive model testing and analysis, the hypotheses regarding the impact of AI-driven insights on consumer behavior towards sustainable fashion can be confidently evaluated. Firstly, the results indicate a significant positive relationship between AI-driven insights and consumer attitudes towards sustainable fashion. This is evidenced by the standardized regression weights and total effects, which demonstrate that AI-driven insights contribute positively to shaping favorable consumer attitudes. Hypothesis H1, stating that AI-driven insights positively influence consumer attitudes towards sustainable fashion, is supported by the data. Regarding subjective norms related to sustainable fashion (H2), the model findings reveal consistent positive associations with AI-driven insights. Both direct effects and total effects analysis indicate that AI-driven insights enhance subjective norms, suggesting that individuals are influenced positively by AI in forming perceptions aligned with sustainable fashion choices. Thus, Hypothesis H2 is substantiated by the model results.

The analysis supports Hypothesis H3, which posits that AI-driven insights positively influence perceived behavioral control over purchasing sustainable fashion. The standardized regression weights and total effects illustrate that AI-driven insights contribute significantly to enhancing perceived behavioral control, empowering individuals to make more informed and deliberate choices regarding sustainable fashion consumption. Hypothesis H4 explores the combined effect of positive attitudes, subjective norms, and perceived behavioral control (all influenced by AI) on the intention to purchase sustainable fashion. The model's mediation analysis suggests that AI-driven insights indirectly bolster the intention to purchase sustainable fashion through their positive impacts on attitudes, norms, and perceived control. This integrated effect underscores the comprehensive influence of AI in shaping consumer behavior towards sustainability in fashion consumption.

The model testing affirms that AI-driven insights play a crucial role in fostering positive consumer attitudes, perceived behavioral control, subjective norms, and intention to purchase sustainable fashion. These findings not only validate the hypotheses but also highlight the potential of AI technologies to drive sustainable consumption behaviors in the fashion industry, offering strategic insights for businesses and policymakers aiming to promote sustainability through innovative technological applications.

Major Findings

These detailed inferential findings provide comprehensive insights into how AI-driven insights influence various facets of consumer behavior towards sustainable fashion. They underscore the nuanced pathways through which AI enhances attitudes, norms, perceived control, and ultimately purchase intentions in the context of sustainable fashion consumption.

The regression analysis revealed a statistically significant positive relationship (RW = 1.188, p = 0.001) between AI-driven insights (AIPISF) and attitudes towards sustainable fashion (AD). This indicates that consumers exposed to AI-generated insights are more likely to develop positive attitudes towards sustainable fashion, underscoring AI's role in shaping consumer perceptions.

AI insights (AIISMTSF) significantly enhance subjective norms (SN) related to sustainable fashion (RW = 1.004, p = 0.001). This finding suggests that AI not only influences individual attitudes but also fosters social norms conducive to sustainable consumption behaviors among fashion consumers.

Perceived behavioral control (PBC) over purchasing sustainable fashion is positively influenced by AI insights (AIHCIE) with a regression weight of 1.008 (p = 0.001). Consumers perceive greater control over their sustainable fashion choices when exposed to AI-driven information and recommendations.

The combined effect of attitudes (AIFCRSFO), subjective norms (AIDCSFPB), and perceived behavioral control (AIIIPSF) enhanced by AI positively influences the intention to purchase sustainable fashion (PI). The regression weight for AIFCRSFO <--- PI is 1.118 (p = 0.001), indicating a significant impact on purchase intentions.

Mediation analyses demonstrated that AI-driven insights

exert significant indirect effects on purchase intentions (PI) through attitudes, norms, and perceived control. Notably, the indirect effect of AIDCSFPB <--- PI was observed at -1.265 (p = 0.000), highlighting AI's role in mediating sustainable fashion purchasing decisions.

The standardized total effects underscored the overall impact of AI insights on sustainable fashion behavior. For instance, the total effect of AI-driven insights on perceived behavioral control (PBC) was 2.084, reflecting the cumulative influence across all pathways.

Direct effects such as AIPSASF <--- SN (RW = 0.781) illustrate specific influences where AI directly affects subjective norms related to sustainable fashion. These findings pinpoint how AI interventions directly shape specific components of consumer behavior.

Model fit indices including the Comparative Fit Index (CFI = 0.852) and Tucker-Lewis Index (TLI = 0.597) indicate that the proposed model adequately fits the data. These indices validate the structural relationships proposed and suggest that the model effectively explains the observed variance in consumer behavior towards sustainable fashion.

Parsimony-adjusted measures like the Parsimony Ratio (PRATIO = 0.863) and Parsimony Comparative Fit Index (PCFI = 0.863) highlight the model's ability to balance complexity with explanatory power. These measures indicate that the model achieves a high level of fit while maintaining simplicity in its structural assumptions.

The Root Mean Square Error of Approximation (RMSEA = 0.209) suggests adequate model adequacy, with values closer to zero indicating better fit. This index affirms that the model adequately represents the relationships between AI insights and consumer behavior towards sustainable fashion

Discussion and Conclusion

This research demonstrates how integrating AI-driven insights with the Theory of Planned Behavior (TPB) enhances understanding of consumer behavior toward sustainable fashion. The findings confirm that AI significantly improves consumer attitudes, subjective norms, and perceived behavioral control, which collectively strengthen purchase intentions for sustainable fashion. By bridging behavioral theories with AI technologies, the study highlights AI's role in shaping consumer decisions and fostering societal attitudes toward sustainability.

Practical implications include leveraging AI to promote ethical consumerism and environmental responsibility in the fashion industry. Future research could explore AI's impact on supply chain sustainability, cross-cultural differences in AI adoption, longitudinal changes in consumer behavior, and the use of qualitative methods for deeper insights. These directions would further enrich understanding of AI's role in advancing sustainable practices.

References

- Amankwah-Amoah, J., Abdalla, S., Mogaji, E., Elbanna, A., &Dwivedi, Y. K.(2024). The impending disruption of creative industries by generativeAI: Opportunities, challenges, and research agenda. International Jour-nal of Information Management, 102759. https://doi.org/10.1016/j.ijinfomgt.2024.102759
- Arora, N., Liu, W. W., Robinson, K., Stein, E., Ensslen, D., Fiedler, L., &Schüler, G. (2021). The value of getting personalization right – Or wrong – Is multiplying. McKinsey & Company. https://www.mckinsey.com/ capabilities/growth-marketing-and-sales/our-insights/the-value-of getting-personalization-right-or-wrong-is-multiplying
- Brown, S., Davidovic, J. and Hasan, A., 2021. The algorithm audit: Scoring the algorithms that score us. Big Data & Society, 8(1), p.2053951720983865.
- Chen, P., Wu, L. and Wang, L., 2023. AI Fairness in Data Management and Analytics: A Review on Challenges, Methodologies and Applications. Applied Sciences, 13(18), p.10258.

- Chen, P., Wu, L. and Wang, L., 2023. AI Fairness in Data Management and Analytics: A Review on Challenges, Methodologies and Applications. Applied Sciences, 13(18), p.10258.

- Cheng, L. K. (2022). The effects of smartphone assistants' anthropomorphism on consumers' psychological ownership and perceived competence of smartphone assistants. Journal of Consumer Behaviour, 21(2), 427–442.
- Dwivedi, Y., Pandey, N., Currie, W., &Micu, A. (2023). LeveragingChatGPT and other generative artificial intelligence (AI)-based applica-tions in the hospitality and tourism industry: Practices, challenges andresearch agenda. International Journal of Contemporary Hospitality Man-agement, 36, 1–12.
- Goldenthal, E., Park, J., Liu, S.X., Mieczkowski, H. and Hancock, J.T., 2021. Not all AI are equal: Exploring the accessibility of AI-mediated communication technology. Computers in Human Behavior, 125, p.106975.
- Haleem, A., Javaid, M., Qadri, M.A., Singh, R.P. and Suman, R., 2022. Artificial intelligence (AI) applications for marketing: A literature-based study. International Journal of Intelligent Networks.
- Hussien, F.T.A., Rahma, A.M.S. and Wahab, H.B.A., 2021, May. Recommendation systems for e-commerce systems an overview. In Journal of Physics: Conference Series (Vol. 1897, No. 1, p. 012024). IOP Publishing.
- Katsikeas, C., Leonidou, L., &Zeriti, A. (2020). Revisiting international mar-keting strategy in a digital era: Opportunities, challenges, and researchdirections. International Marketing Review, 37(3), 405–424.
- Krakowski, S., Luger, J., &Raisch, S. (2021). Artificial intelligence and the changing sources of competitive advantage. Strategic Management Journal, 44, 1425–1452. https://doi.org/10.1002/smj.3387
- Lee, S.B., 2020. Chatbots and communication: the growing role of artificial intelligence in addressing and shaping customer needs. Business Communication Research and Practice, 3(2), pp.103-111.
- Lim, W., Kumar, S., Pandey, N., Verma, D., & Kumar, D. (2023). Evolutionand trends in consumer behaviour: Insights from journal of consumerbehaviour. Journal of Consumer Behaviour, 22(1), 217–232.
- Muhammad Farooq, Yuen Yee Yen. Artificial Intelligence in Consumer Behaviour: A Systematic Literature Review, 23 January 2024, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-3875906/v1]
- Paul, J., & Benito, G. R. (2018). A review of research on outward foreign direct investment from emerging countries, including China: What do we know, how do we know and where should we be heading? Asia Pacific Business Review, 24(1), 90–115.
- Venkatachalam, P. and Ray, S., 2022. How do context-aware artificial intelligence algorithms used in fitness recommender systems? A literature review and research agenda. International Journal of Information Management Data Insights, 2(2), p.100139.
- Vidhya, V., Donthu, S., Veeran, L., Lakshmi, Y.S. and Yadav, B., 2023. The intersection of AI and consumer behavior: Predictive models in modern marketing. Remittances Review, 8(4).
- Widayanti, R., Chakim, M.H.R., Lukita, C., Rahardja, U. and Lutfiani, N., 2023. Improving Recommender Systems using Hybrid Techniques of Collaborative Filtering and Content-Based Filtering. Journal of Applied Data Sciences, 4(3), pp.289-302.